



# Utilizing Host Immune Response to Differentiate Between Bacterial and Viral Infections

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DiaSorin

**LIAISON® MeMed BV® Overview**

**Clinical and Technical Features**

**Case Studies**



## **LIAISON® MeMedBV**

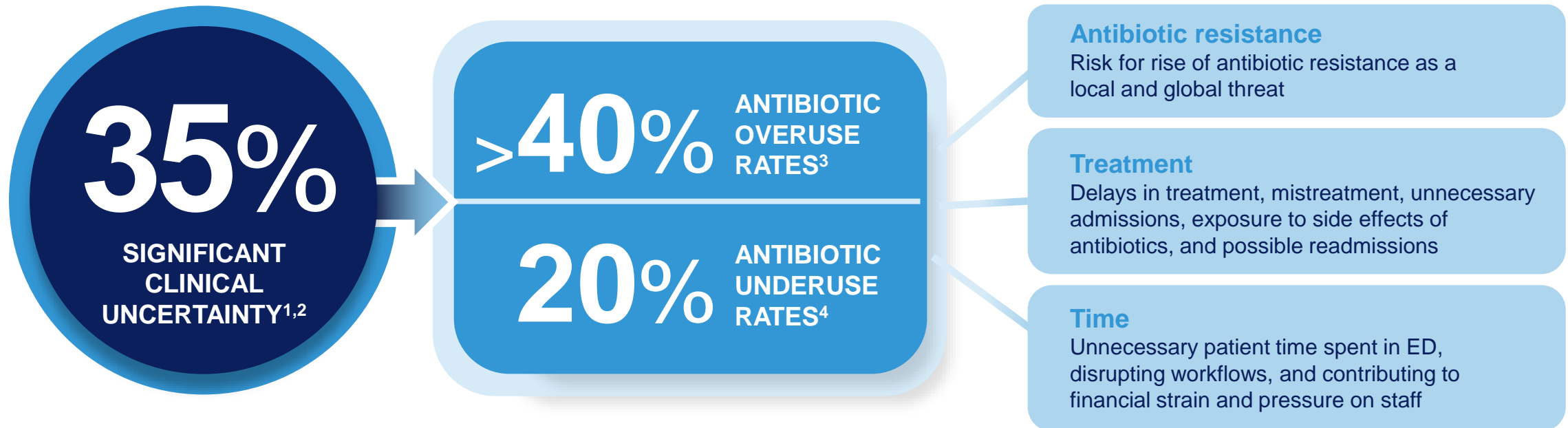
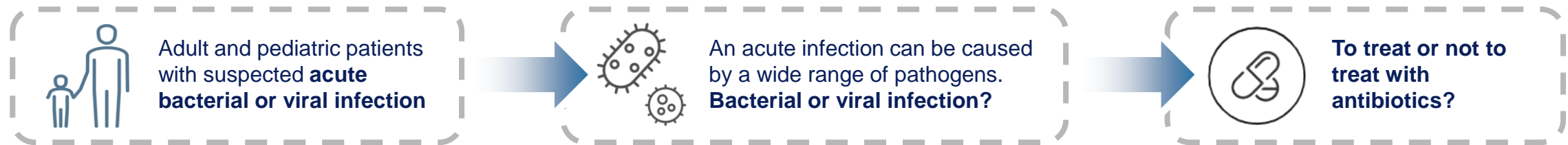
The new test enables physicians to accurately differentiate between bacterial and viral infections, thus supporting fast and more-informed treatment and patient management decisions.

This innovative solution will be soon available on DiaSorin LIAISON® XL and XS systems.



# The problem for clinicians

Bacterial and viral infections are often clinically indistinguishable.



Sources: 1. MeMed survey of ED pediatricians (n=42). 2. D Wang, et al. Primary Care Respiratory Medicine (2021). 3. Antibiotic use in the United States: Progress and opportunities — 2018 update, Center of Disease Control and Prevention (CDC). 4. Kornblith, et al. Predictors for under-prescribing antibiotics in children with respiratory infections requiring antibiotics (2018).



# The problem for labs

Today's diagnostic methods to distinguish between bacterial and viral infections are imperfect



Prolonged time to results  
(up to 2 days)



Inaccessible infection sites



Often, no pathogens are detected



Undetected bacterial co-infections



False alarms due to natural flora  
(detection=disease)

The lack of available tools that can provide an accurate answer within the workflow timeline creates **costly inefficiencies** and plays a major role in the **misuse of antibiotics—which has local and global implications.**

# Introducing the revolutionary **LIAISON® MeMed BV®**

Together, DiaSorin and MeMed Diagnostics Ltd partnered to develop the LIAISON® MeMed BV® test for the LIAISON® family of analyzers—the first CLIA, fully automated and high-throughput assay to identify whether a patient presenting in the ED with a suspected acute infection has a bacterial or viral infection.



## USE LOCATION

Hospital emergency departments



## USE POPULATION

Adult and pediatric patients with suspected acute bacterial or viral infection



## RESULTS TIME

Results can be returned in as little as **35 minutes**



## PERFORMANCE

Greater than 99% viral identification agreement\*

**99%+**

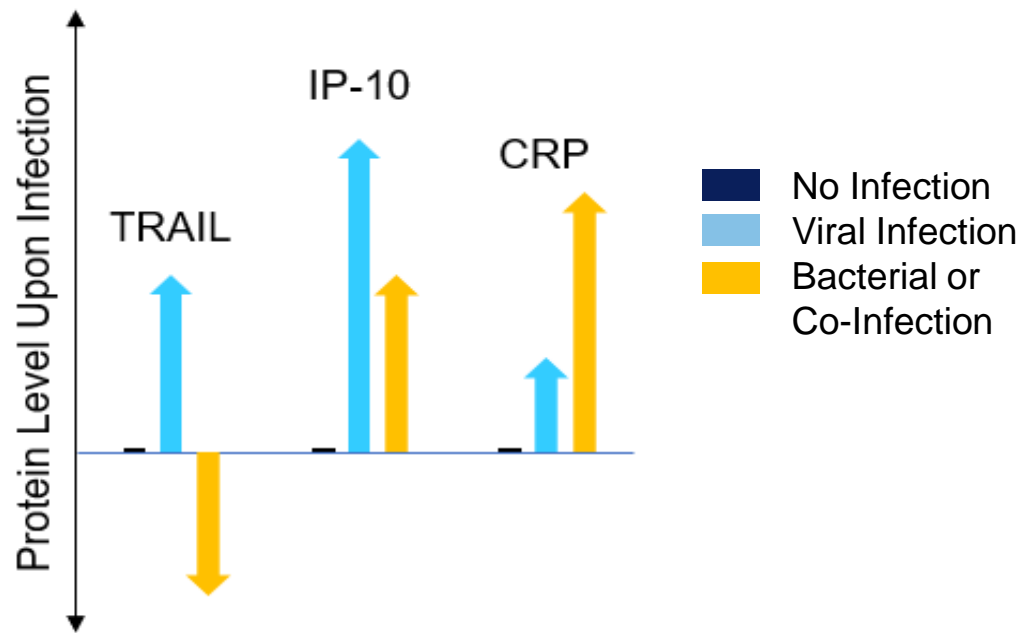
**LIAISON® MeMed BV®** delivers powerful diagnostics to increase confidence in patient treatment decisions

Significantly better performance than other clinical parameters and well-established markers

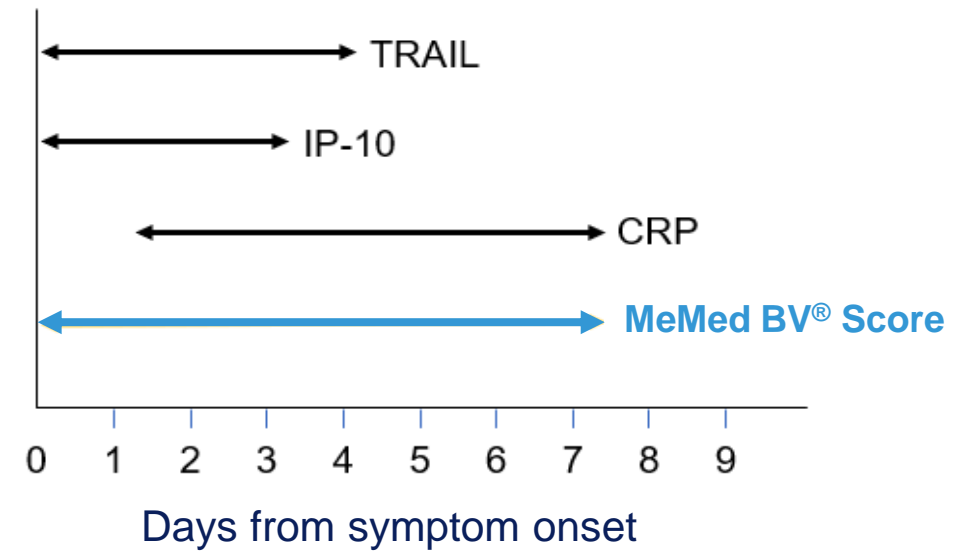
Improves the quality of a patient's life by optimizing antibiotic use and helps promote antimicrobial stewardship

# Robust behavior of the markers produces a generalizable score

## Single Protein Analysis vs MeMed BV<sup>®</sup> Score



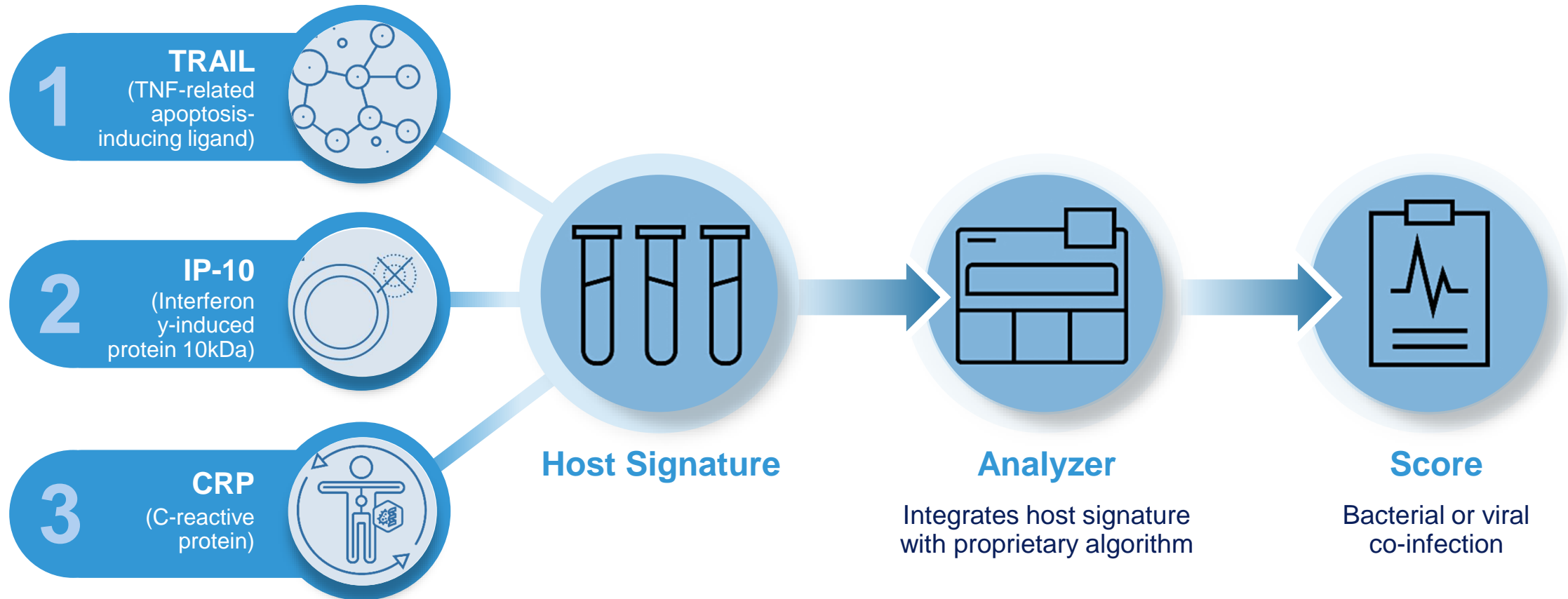
## When Biomarker or MeMed BV<sup>®</sup> Score is Useful



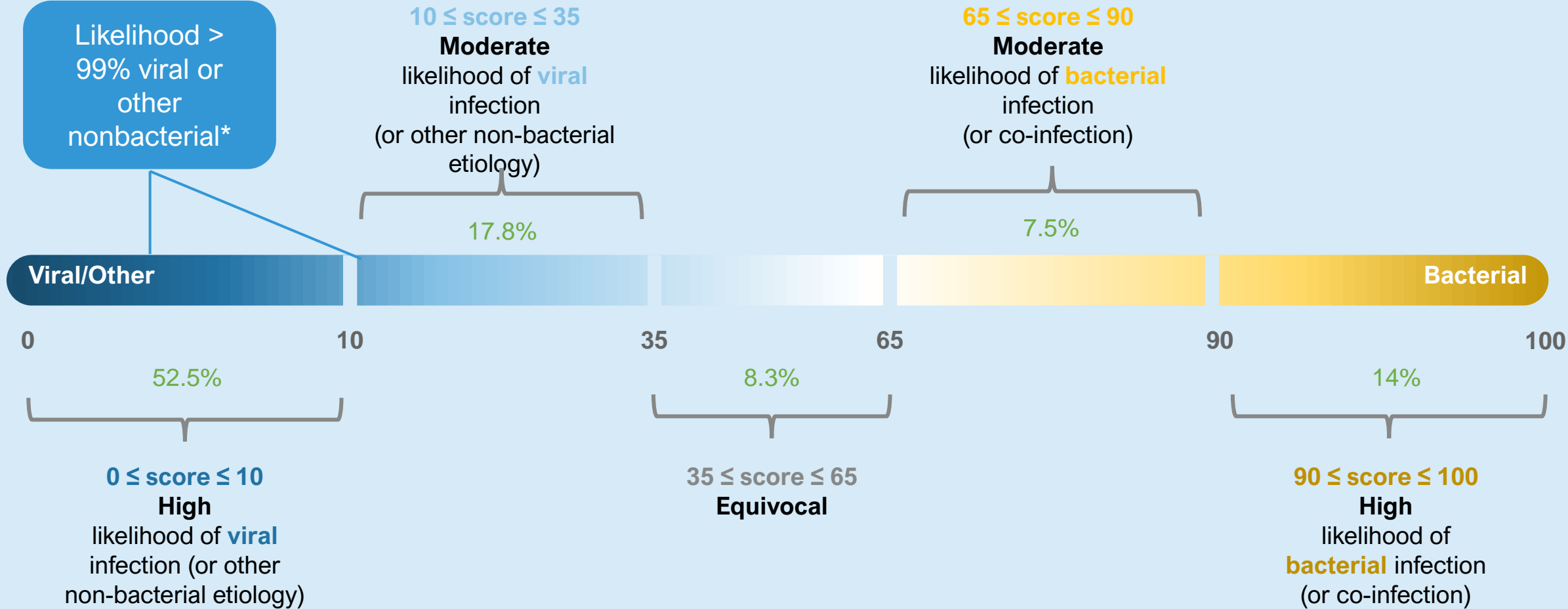
The result is a single qualitative score showing the likelihood of a bacterial or viral infection.

# How it works

The LIAISON® MeMed BV® discriminates bacterial and viral infections by leveraging an immune-based protein signature test that measures and computationally **integrates the levels of three host-proteins** (TRAIL, IP-10 and CRP) and assigns a score indicating the likelihood of a bacterial or viral infection.



# LIAISON® MeMed BV® results and interpretation



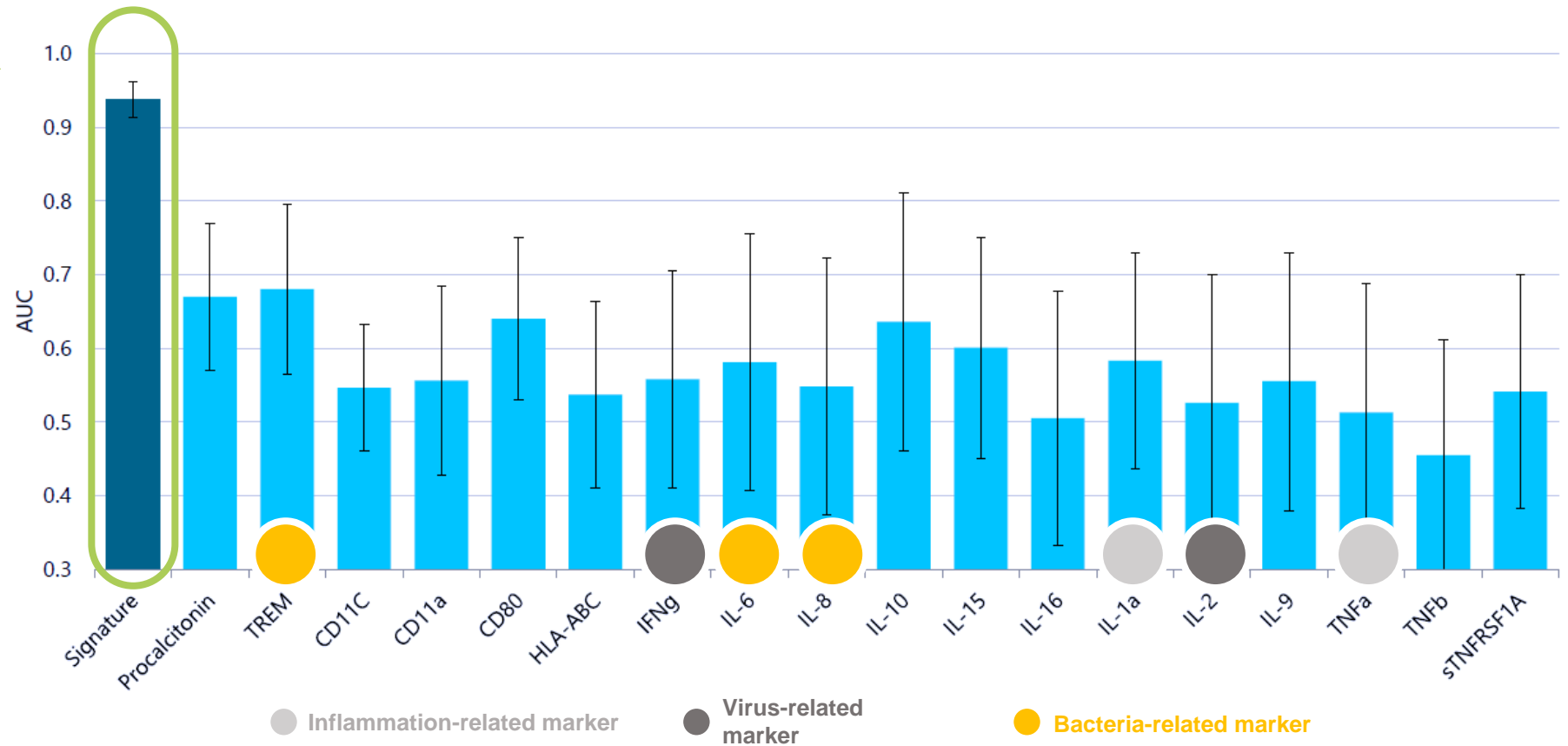
Patient distribution on LIAISON® MeMed BV® scale

\*Likelihood based on Apollo study secondary endpoints results



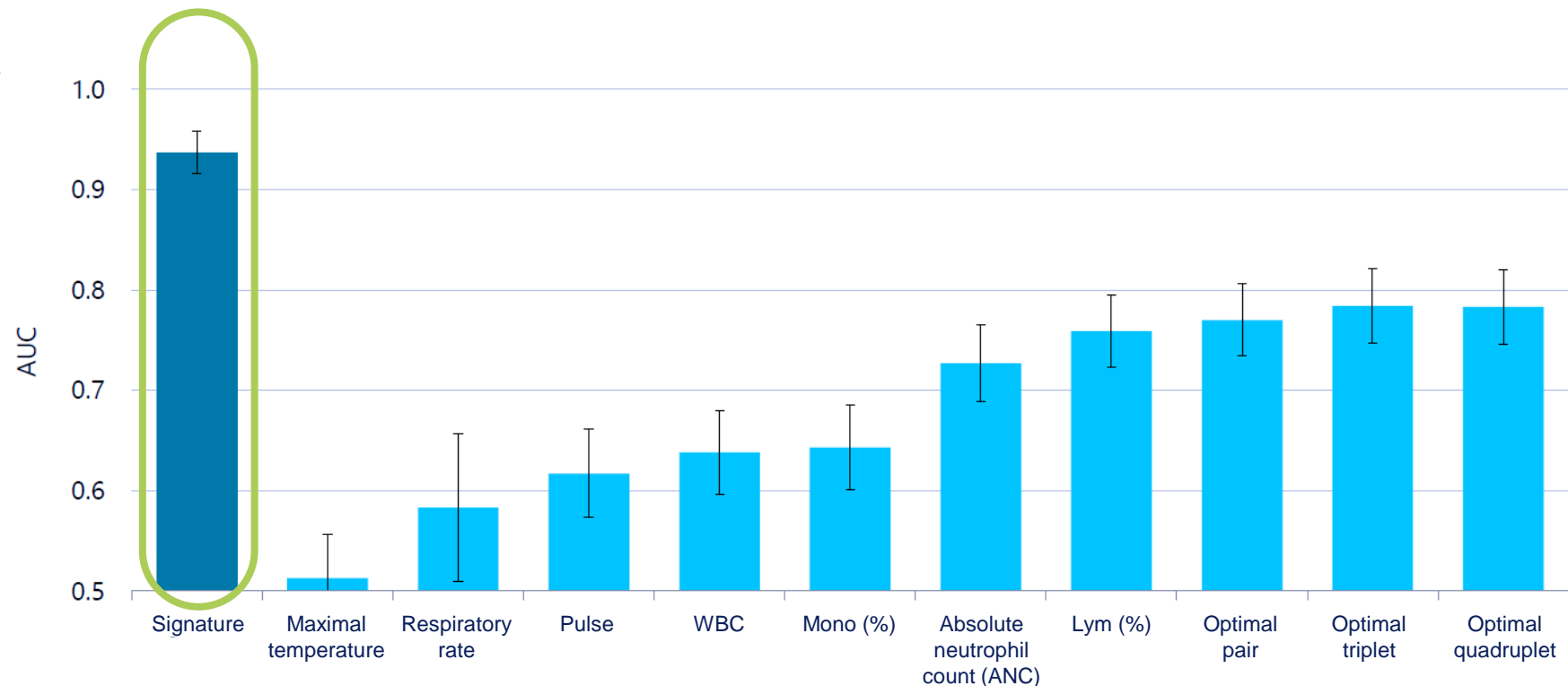
# The host-protein signature performance versus laboratory measurements

The signature performs significantly better ( $P < 10^{-8}$ ) than individual markers with a well-established role in the host response to infections



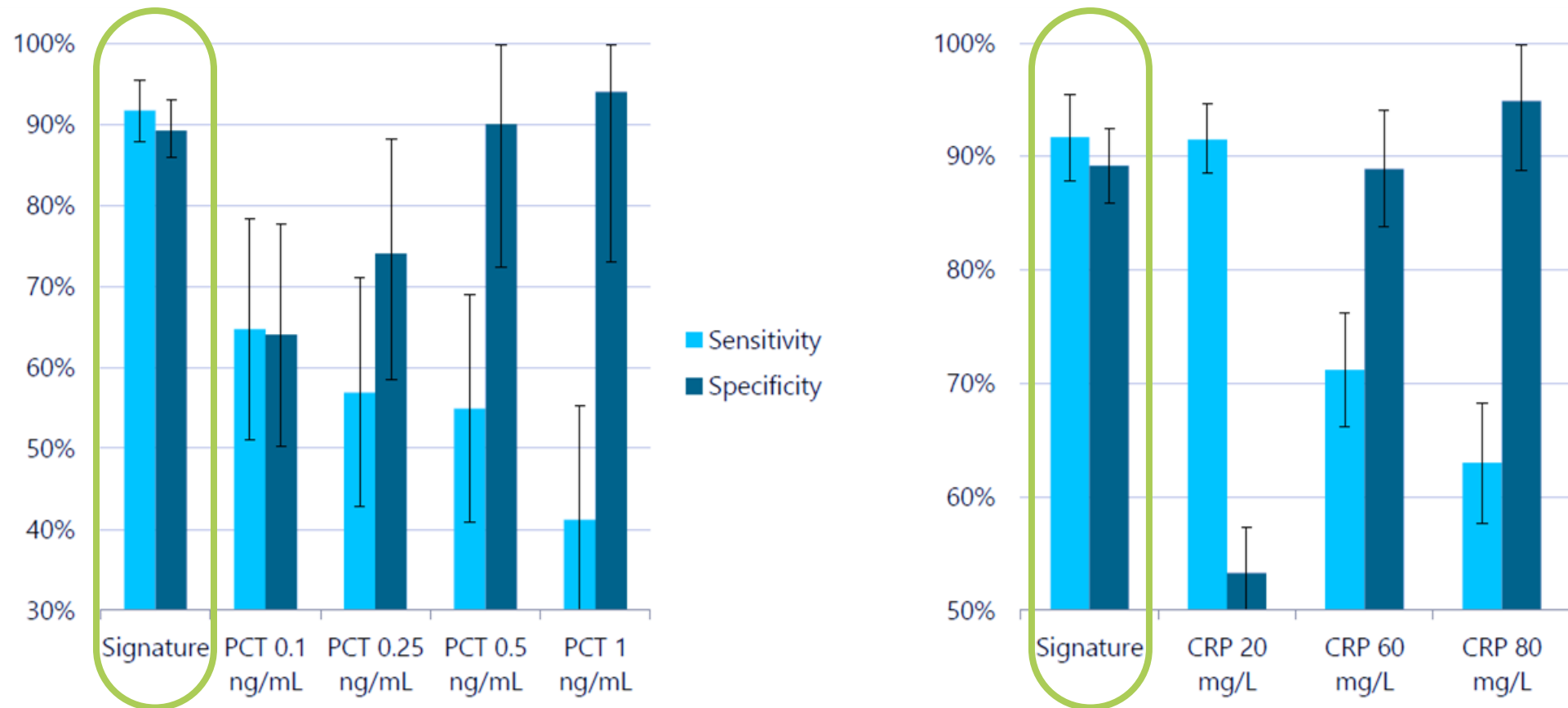
# The host-protein signature performance versus clinical parameters

The signature exceeds the best-performing combination of clinical parameters ( $P < 10^{-15}$ )



# Performance comparison to PCT and CRP

The signature performed significantly better than both PCT and CRP individual markers, showing the most pronounced diagnostic accuracy to differentiate bacterial and viral infections



# Case Studies



**To treat  
or not  
to treat?**

## **LIAISON® MeMedBV**

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This innovative solution will be soon available on DiaSorin LIAISON® XL and XS systems.



# CASE STUDY 1: 83-Year-Old Woman



## Clinical Examination



Temperature  
38.5°C



HR 85  
beats/min



RR 20  
breaths/min

- Appears well
- No acute distress
- Revealed rales (crackles) bilaterally but greater on the right





# CASE STUDY 1: 83-Year-Old Woman



## Diagnostic Testing

### Lab Tests

- Respiratory panel (COVID-19, flu, RSV)
- Complete Blood Count (CBC)
- Basic Metabolic Panel (BMP)
- Urinalysis (UA)
- Urine culture
- **NEW-LIAISON® MeMed BV®**

### Other Tests

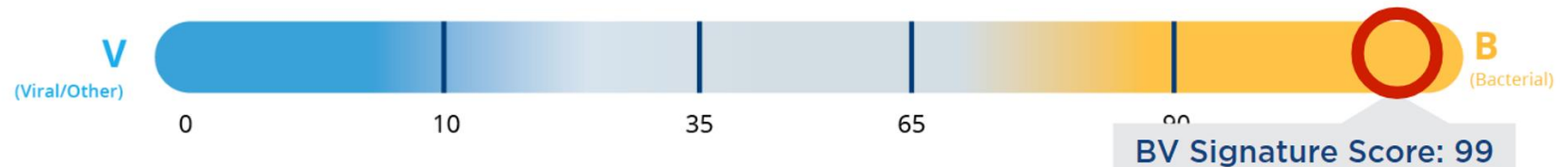
- Chest x-ray
- Electrocardiogram (ECG)
- CRP



## Results

- Normal: Respiratory mini panel, BMP, UA, ECG
- High Normal: White Blood Count (WBC) 11K
- Elevated: Absolute Neutrophil Cells (ANC) 9K
- Chest x-ray revealed RUL infiltrated
- Moderately Elevated: CRP 23 mg/dL

### LIAISON® MeMed BV® testing:



# CASE STUDY 1: 83-Year-Old Woman



## Clinical Course of Action

- Admitted to the hospital
- Prescribed amoxicillin-clavulanate plus azithromycin
- Extended respiratory pathogen panel performed: negative
- Blood culture performed: negative



## Further Evaluation

- Fever and rales resolved over 3 days
- Discharged home
- Follow-up chest x-ray after 6 weeks showed resolution of pulmonary infiltrate

# CASE STUDY 1: 83-Year-Old Woman



## LIAISON® MeMed BV® Testing Final Diagnosis

### Timely Bacterial-Viral Discrimination

- LIAISON® MeMed test permitted detection of bacterial pneumonia when history, physical examination and some laboratories suggested viral pneumonia
- Consistent with CXR showing RUL infiltrate
- Antibiotics administered in a timely manner

### LIAISON® MeMed BV® testing:



# CASE STUDY 2: 5-Month-Old Girl



## Initial Clinical Presentation



Previously healthy



No medications



Vaccines up to date

- Poor appetite, vomited twice
- Normal urination
- Has a 2-year-old sibling who had an upper respiratory tract infection with fever one week prior to the present illness





# CASE STUDY 2: 5-Month-Old Girl



## Clinical Examination



Temperature  
40°C



HR 180 bpm BP  
96/64 mmHg



RR 60  
O<sub>2</sub> Sat 97%

- Physical exam revealed decreased breath sounds bilaterally and crepitation on the right
- Fontanelles were slightly depressed and pulsatile





# CASE STUDY 2: 5-Month-Old Girl



## ED Evaluation

- Clinical assessment and vital signs were repeated with findings similar to those at the pediatrician
- **Imaging:** Chest x-ray - bilateral perihilar infiltrates
- **Laboratory testing:**
  - Blood cultures obtained
  - Negative viral molecular panel C-19, flu A/B, RSV
  - White Blood Count (WBC) 20K (elevated)
  - Absolute Neutrophil Count (ANC) 14.6K (elevated)
  - CRP 10 mg/dL (elevated)



# CASE STUDY 2: 5-Month-Old Girl



## ED Assessment

- Possible pneumonia
- Mild dehydration
- Chest X-ray and elevated temperature, HR, RR, WBC, ANC and CRP are consistent with bacterial infection but can also be seen in viral infection



## ED Plan

- LIAISON® MeMed BV® test, followed by chest CT if necessary to distinguish bacterial vs viral infection
- Additional molecular respiratory testing

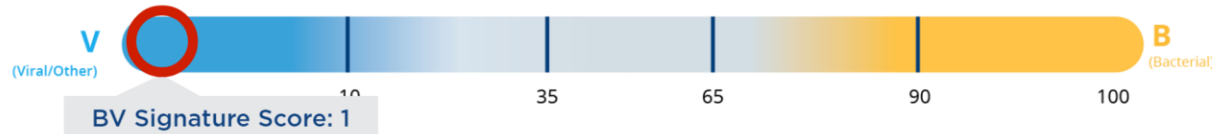
# CASE STUDY 2: 5-Month-Old Girl



## Results

**LIAISON® MeMed BV® testing:**  
High likelihood of viral infection  
(or other non-bacterial etiology)

**Molecular Respiratory testing:**  
Positive for adenovirus and metapneumovirus



## Clinical Course of Action

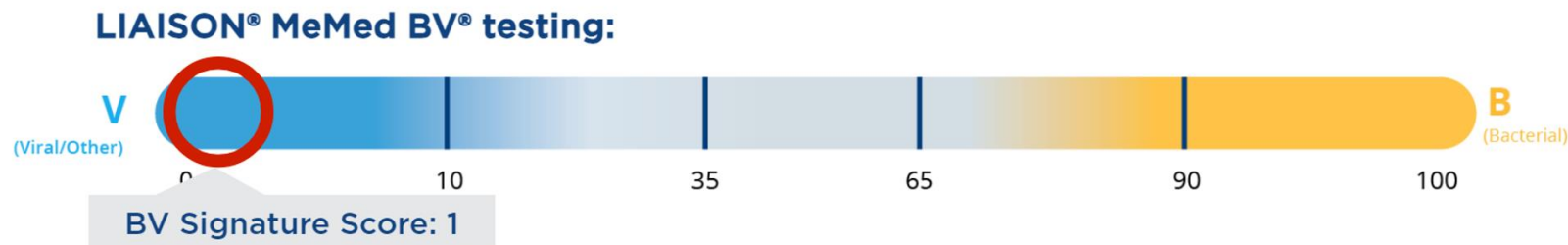
- Supportive care administered
- Fever, tachycardia, tachypnea resolved
- Discharged home

**DIAGNOSIS:** Viral bronchiolitis caused by adenovirus and metapneumovirus

## CASE STUDY 2: 5-Month-Old Girl

### LIAISON® MeMed BV® Testing Final Diagnosis

- Viral bronchiolitis caused by adenovirus and metapneumovirus
- LIAISON® MeMed BV® score indicated very low chance of bacterial pneumonia
- A chest CT scan was not needed
- Antibiotic treatment was not required



# Clinical Case Summaries

1

## Timely antibiotic administration

Patient with pneumonia without initial localized signs.

Patient management was changed, and antibiotics administered in a timely manner.

2

## Antibiotic use not necessary

Clear viral etiology

BV signature prevented antibiotic use, currently it required reviewing CXR a second time.

The BV signature can impact clinical decision pathway and patient management.



# Improving clinical certainty around treatment decisions

## Situation

- Lack of a true, objective decision-making tool to distinguish between bacterial and viral infections leads to overuse of antibiotics
- Costs valuable time, money and peace of mind

## Solution

- LIAISON® MeMed BV® delivers fast differentiation between bacterial and viral
- Transforms treatment of infectious diseases and improves confidence/satisfaction for clinician and patient

## Science

- LIAISON® MeMed BV® automatically measures, analyzes and integrates the levels of three host immune proteins to show likelihood of a bacterial immune response versus viral

## Performance summary:

**Greater than 99%  
viral identification  
agreement\***



**99%+**

**LIAISON® MeMed BV®**  
delivers powerful diagnostics  
to increase confidence in  
patient treatment decisions

Questions ???

Thank You